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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/718,346	11/20/2003	George A. Pavlath	NGC-153/000060-199	1241

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EXAMINER	
CHIEM, DINH D	

ART UNIT	PAPER NUMBER
2883	

DATE MAILED: 08/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/718,346	PAVLATH, GEORGE A.	
	Examiner	Art Unit	
	Erin D. Chiem	2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 June 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This office action is in response to the amendment filed on 02 June 2005. Currently, claims 1-25 are pending.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vengsarkar (US 5,430,817) in view of Orthonos et al. (Artech House, Inc., 1999) and in further view of Golberg et al. (US 6,731,837) and Michal et al. (US 6,025,915).

Vengsarkar discloses an apparatus comprising a light source (col. 4, line 54), a first long period grating (Fig. 5, 57) optically coupled with the light source; and an amplification fiber (54) that is optically coupled with the long period grating; wherein the light source send one or more pump optical signals (56) to the long period grating; wherein the long period grating transmits the one or more pump optical signals to the amplification fiber; wherein the amplification fibers absorbs a subset of the one or more pump optical signals and emits one or more output signals; where in the long period gratings attenuates the one ore more output signals. Long period gratings are well known, will be proven in the subsequent sources, to attenuate (or also known as loss, SearchNetworking.com) for it was designed to discriminate by rejecting desired wavelengths dependent on apparatus building specifications. Hence, the pump signals sent

through by element 56 into the long period grating 57 is pumped at a range of wavelengths and the output wavelength sent from long period grating 58 is without a range of wavelength, or can also be interpreted as "substantially same second wavelength" relative to the signal sent from long period grating 57 "substantially first wavelength." As closely disclosed by Vengsarkar 1 in how to space the gratings in such a way that the gain flattening or more well known as attenuation can be more uniform over a range of wavelengths of 1530 – 1560 (col. 3 line 65 - col. 4, line 14). Furthermore, the limitations regarding reducing or promoting decrease in backreflections and the limitations regarding the residual signals from the gratings are merely characteristics of the long period Bragg gratings. However, Vengsarkar does not disclose "long-period Bragg gratings" but only referred to as long period gratings as the optical elements for attenuating the unused pumped energy. Furthermore, Vengsarkar does not disclose employing fusion splice as the coupling means for the separate elements: light source, long period gratings, pumping elements, and the erbium doped fibers. And finally, Vengsarkar does not disclose sending the output signal into an optical gyroscope.

Orthonos et al. teach in the fundamental theories of Bragg gratings that long period gratings are a species of Bragg gratings. Orthonos cross referenced to Vengsarkar 2 as the scientist who found the characteristics of the long period gratings can be applied as low-loss band-rejection filters. The periodicity of the long period grating is chosen to couple light from the guided single mode LP_{01} of the fiber into the forward propagating cladding modes, where it is lost due to absorption, such as erbium doped amplification fibers, and scattering. The phase-matching condition that determines the exact periodicity of the grating; for two forward-propagating modes (i.e., first wavelength and second wavelength) dictates that the period of the Bragg grating must be long or longer than the transmitting wavelength. Such forward

propagating coupling is key to the sought after characteristic of low backreflection in long-period Bragg grating (Orthonos, pp. 142 – 143).

Goldberg et al. disclose an optical fiber amplifiers and lasers and optical pumping device which employ fusion splicing through out the device for the purpose of low loss coupling, well-known in the art, and for the removal of pump light in the cladding [0058].

Michal et al. teach a system for performing scale factor stabilization of a broadband optical signal used in fiber optic gyroscopes employing a broadband light source, pump laser diode, and placing the gyroscope in line with the bandpass filter which stabilize the centroid wavelength. This is critical in the apparatus since the bandpass filter only allow a narrow band of wavelength 1540 – 1570 nm wavelengths to pass, the centroid wavelength, and attenuate the rest of the wavelength. The linearization scale factor is determined by the output optical signal sent to a photodetector convert the optical signal intensity of the interference pattern produced by combining the waves that have propagated through the sensing coil to an electrical signal. The scale factor allows the measure of the rotation of the gyro and the phase information to be correlated (col. 5, line 13-42). Michal et al. teaching of scale factor stabilization of a broadband fiber source used in fiber optic gyroscopes is for the purpose of reducing the linearization scale factor error when the sensing coil in such measuring apparatus is exposed to ionization radiation which cause the centroid wavelength to shift. Furthermore, Michal et al. teach the filtering of pumped broadband input signal through the coupling of modes into the cladding of the fiber through hi-pass filter and low-pass filter result in the narrowband output (Fig. 7B, col. 4, line 37-59).

Since Vengsarkar, Orthonos et al., Goldberg et al. and Michal et al. are all from the same field of endeavor, the purpose disclosed by Orthonos et al., Goldberg et al. and Michal et al. would have been recognized in the pertinent art of Vengsarkar.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to: 1) Alternatively label spectral shaping device such as a long period grating as "long period Bragg grating" since long period grating is a species of Bragg grating. 2) In a measuring system which employs a broadband light source, a pump laser diode, Erbium doped amplification fibers, long period Bragg gratings, and other optical components such as photodetectors and optical gyroscope that it would have been obvious to employ fusion splicing in place of the broadly claimed six different splices indicated by Michael et al. in Fig. 5, in which the Examiner respectfully point out reads on all of the positions of the Applicant's claimed positions of first, second, third, and fourth splice. **The motivation** for employing fusion splicing rather than mechanical splicing is for the economical value of fusion splicing and fusion splices require extraneous splicing components such as V-shaped metal clamps, see non-patent literature "Lennie Lightwave's Guide to Fiber Optics: Termination and Splicing" for more comparative details. Another **motivation** for using fusion splicing is the low loss coupling ability that fusion splicing provides to the system. And most importantly, fusion splicing double cladding fibers to remove residual pump/residual light in the cladding. 3) It is clearly obvious at the time the invention was made to a person having ordinary skill in the art to use the long period bandpass filter. Vengsarkar taught that **the motivation** for employing is that long period bandpass filter is less susceptible to ionization radiation to stabilize the centroid wavelength for providing more correct linearization scale factor such that the rotation of the gyroscope and phase information of the optical signal may be correlated to extract parameters of interest. Such measuring instrument is most beneficial in harsh and radiation environment.

Response to Arguments

Applicant's remarks concludes to one argument that the references a lone or in combination does not teach a gain fiber that absorbs a subset of one or more pump optical signals and emits one or more output signals toward the light source.

In response to applicant's arguments against Vengsarkar, Orthonos, and Goldberg references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's argument that the references fail to show certain features of applicant's invention (page 13, 3rd paragraph to page 15, 3rd paragraph), it is noted that the features upon which applicant relies (i.e., light source is a laser diode) are not recited in the rejected claim(s) 1-14. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Furthermore, as acquiesced by Applicant on page 14 in the quoted column 4, lines 38-44) that Michal teaches a gain fiber 218 absorbs part of the pump light and emits light propagating lengthwise in both direction, (i.e., toward the light source). Michal's reference was incorporated to modify Vengsarkar's reference. Michal's WDM coupler is the element incorporated to improve Vengsarkar's device, thus there is no motivation to remove the WDM in Michal's system and revert back to Vengsarkar's original device.

In addition to the above responses, the Examiner respectfully points out that Applicant is arguing an inherent characteristic of Erbium-doped amplification fiber. The Erbium Doped Fiber Amplifier uses an optical fiber doped with erbium atoms as the amplification medium. Pump lasers on wavelengths below those being amplified are coupled to the doped fiber, causing

excitation of the erbium atoms in the fiber (the erbium atoms absorb energy from the pump lasers), charging them to a higher energy state. The optical signals enter the doped fiber at one end. The excited erbium atoms donate their energy to the optical signals as they pass through the fiber, and the energy level of those signals increases. Depending upon the length of the doped fiber and the power of the pump lasers, the optical signals leaving the doped fiber can be anywhere from 10 to 50 times stronger than were when they entered the EDFA. All of the amplification was done in the optical domain. EDFAs are used primarily on long haul fiber optic links like undersea cables and long run terrestrial links.

Conclusion

Therefore, in combination of the references of Vengsarkar, Michal, Orthonos, and Golberg the limitations of claims 1-25 are met and the Examiner asserts the rejection is proper.

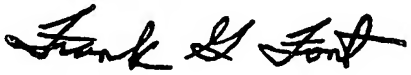
Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erin D. Chiem whose telephone number is (571) 272-3102. The examiner can normally be reached on Monday - Thursday 9AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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